State Of Washington
Military Department

Chemical Hazard Communication (HAZCOM) Handbook

Summary: This Handbook is a reference document to compliment WMD Policy 01-040-05. It is designed to provide additional policy and supporting procedures for the Military Department's Hazard Communication Program for State employees.

INTRODUCTION:

Washington Administrative Code 296-800-170 sets requirements for information and training on hazardous chemicals used in the work place. Federal law requires all states to comply with hazard communication regulations. Washington's standards are tailored to the industries in our state.

NOTE ON CONSUMER PRODUCTS:

Consumer products are not considered hazardous when it can be demonstrated the products are used in the workplace in the same manner as consumer use. This means that when a chemical product is used in the work place with the same duration and frequency of exposure that is experienced by consumers than it may not be considered hazardous.

The following is a partial list of products that are usually hazardous.

Acids	Degreasing Agents	Herbicides	Shellacs
Adhesives	Flammables	Janitorial Supplies	Solvents
Aerosols	Foaming Resins	Lacquers	Surfactants
Battery Fluids	Fuels	Office Copier Chemicals	Varnishes
Catalysts	Fungicides	Paints	Water Treatment Chemicals
Cleaning Agents	Industrial Oils	Pesticides	Wood Preservatives
Detergents	Insecticides	Process Chemicals	

RIGHTS AND RESPONSIBILITIES:

The Employer who uses Hazardous Materials must:

1. Provide a safe workplace for employees.
2. Educate employees about the hazardous materials to which they may be exposed on the job.
3. Recognize, understand, and use warning labels and Material Safety Data Sheets (MSDS).
4. Provide appropriate personal protective clothing, equipment, and train employees on how to use them.
5. Maintain in the workplace a written Hazardous Communication Program that provides for employee training, annual updating of MSDS files and maintaining the Master Hazardous Material Inventory Roster list, and ensuring containers are properly labeled.
6. Notify the State Military Environmentalist of any spill or exposure that may have caused a worker to exceed his/her PEL (Permissible Exposure Limit) or TLV (Threshold Limit Value): see MSDS Form.

The Employee who works with chemicals must:

1. Read all warning labels and MSDSs, and follow their instructions and warnings.
2. Ask their supervisor if they have any questions about handling, storing or exposure to a material.

REMINDER:

Employee's have a "Right-to-Know" and a responsibility to keep informed.

SECTION I - GENERAL

1. HAZCOM PROGRAM: Is intended to protect Department and contract workers from the risks associated with exposures to gases, liquids and powders which contain hazardous chemicals. It is designed to ensure that information about the dangers of some of the chemicals used by our employees is known by affected personnel (See WMD Policy 01-040-05).

2. FACILITIES SURVEY: All work, storage, and occasional use areas will be surveyed by the area supervisor or his/her designee and a list will be made of all chemicals. Any chemical that has the words CAUTION, WARNING, or DANGER on the label must be listed on the Master Hazardous Material Inventory Roster (MIL FORM 909).

3. LIST OF HAZARDOUS CHEMICALS:

   A Master Hazardous Material Inventory Roster (see Appendix A), of all known hazardous materials used in the workplace will be listed by, and maintained in the regional supervisors' office, and a copy posted in any other location as deemed necessary by the supervisor, management, or the Safety Officer/Consultant. The rosters must list the material's common name, the area or shop where used, and whether or not we presently have an MSDS on file for this chemical.

4. EXPLANATION OF TERMS: Special terms used in this manual are explained in the glossary.

SECTION II - SAFETY

5. MATERIAL SAFETY DATA SHEETS (MSDS):

   a. It is the responsibility of the State Military Department Purchasing Agent to ensure that all hazardous materials purchased have the MSDS form(s) delivered with the product (See Appendix B).

   b. Material Safety Data Sheets for each hazardous material to which our employees or the public may be exposed, will be filed in the Hazardous Communication Folder, located in the offices of the regional supervisors. All shops and chemical storage areas will also have a MSDS binder with copies of the MSDS in plain view of anyone entering the area. The regional supervisor will review all newly arriving data sheets for significant health and safety information, and see that new information is passed on to the appropriate employees. A copy of the MSDS must accompany all hazardous material waste when turned in for disposal.

   c. The supervisor will also check each new MSDS sheet for its completeness. If the MSDS is missing or incomplete, the supervisor must notify the purchasing agent immediately, by phone and with a follow-up memorandum.

d. The purchasing agent shall request a completed data sheet from the manufacturer (See Appendix C).

e. All MSDS sheets must be available to all employees and any Labor & Industries inspector during regular business hours.

f. See Appendix D for questions and answers pertaining to MSDSs.

6. CONTAINER LABELING:

a. The regional supervisors will verify that all containers received for use by Military Department employees will be clearly labeled as to the contents, noting the appropriate hazard warning, and listing the name and address of the manufacturer.

b. The supervisor will ensure that all secondary containers are labeled with the common name and the appropriate hazard warnings.

7. EMPLOYEE TRAINING AND INFORMATION:

HAZCOM training will be provided (see Appendix D) consistent with the Chemical Hazard Communication (HAZCOM) Procedure 01-040-05.

8. HAZARDOUS NON-ROUTINE TASKS:

a. Periodically employees are required to perform hazardous non-routine tasks. Some examples of non-routine tasks are: confined space entry, working in excessively high or low temperatures, caustics or acids used in some cleaning operations, or working in an unfamiliar shop, with unfamiliar hazards.

b. Prior to starting work on non-routine projects or areas each affected employee will be given information by his/her supervisor about the hazardous conditions he or she may encounter during such activities. This information will include specific chemicals or hazards, and the appropriate safety measures such as: ventilation, respirators, protective clothing, climate control measures, and the requirement for the presence of another employee.

SECTION III - MISHAP PREVENTION

9. MULTI-EMPLOYEE WORK PLACES: It is the responsibility of the regional supervisor to provide employers of any other employees at a Military Department work site copies of the MSDSs (or make them available at a central location) for any hazardous chemicals that the other employer's, employee(s) may be exposed to while working at that site.

10. POTENTIAL HEALTH HAZARDS: Appendix E is provided as a further reference to assist you to understand the potential health hazards in the workplace associated with chemical exposure.

APPENDIX A

STATE OF WASHINGTON
MILITARY DEPARTMENT

MASTER HAZARDOUS MATERIALS INVENTORY ROSTER **HAZCOM**

MSDS #	PRODUCT DESCRIPTION	PRODUCT BRAND NAME	MFG. PART NUMBER	HAZARDOUS CHEMICAL	LOCATION	REMARKS

MIL FORM 909 20Dec2005
Safety Policy 01-040-05

APPENDIX B

Sample

MATERIAL SAFETY DATA SHEET

PRODUCT INFORMATION		
MANUFACTURER'S NAME AMREP. INC	**MFD. FOR:**	**EMERGENCY PHONE NUMBER** (402) 422-2071
ADDRESS 990 Indus. Pk. Dr. Marietta. Ga. 30062	**ADDRESS**:	
FORMULA **PROPRIETARY**	**TRADE NAME:** Misty Moisture Guard	

II-HAZARDOUS INGREDIENTS			
	CAS#	**% (WT)**	**TLV (ppm)**
METHYL CHLOROFORM	71-55-6	82	350
CARBON DIOXIDE	124-38-9	5	5000
PETROLEUM BASED LUBRICANT	64742-54-7	7	5mg/m^3
PETROLEUM DISTILLATE	8030-30-6	6	500

III- PHYSICAL DATA			
BOILING POINT (^{0}F)	NA	**SPECIFIC GRAVITY (H_2O=1)**	Concentrate 1.21
VAPOR PRESSURE (PSIG)	85-100	**% VOLATILE BY VOLUME**	86
VAPOR DENSITY	NA	**EVAPORATION RATE (=1)**	NE
SOLUBILITY IN WATER	Insoluble	**APPEARANCE AND ODOR**	Light brown liquid, chlorinated solvent odor

IV- FIRE & EXPLOSION HAZARD DATA			
FLAMMABILITY as per **CPSC FLAME EXTENSION TEST** Non-Flammable	**FLAMMABLE LIMITS**	**LOWER** **NA**	**UPPER** **NA**
EXTINGUISHING MEDIA Aerosol is non-flammable:	Foam, dry chemical, carbon dioxide		
SPECIAL FIRE FIGHTING PROCEDURES Self contained breathing apparatus			
UNUSUAL FIRE & EXPLOSION HAZARDS:	Do not expose aerosols to temperatures above 130^0 or the container may explode.		

V-REACTIVITY DATA			
INCOMPATIBILITY (MATERIALS TO AVOID)	Strong oxidizing agents, water		
STABILITY	**UNSTABLE**		
	STABLE	X	**CONDITION TO AVOID** Welding arcs or open flames, heat, sparks
HAZARDOUS DECOMPOSITION PRODUCTS	HCl, and small amounts of phosgene & chlorine		
HAZARDOUS POLYMERIZATION	**MAY OCCUR**		**CONDITIONS TO AVOID -** NONE
	WILL NOT OCCUR	**X**	

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Sample

MATERIAL SAFETY DATA SHEET

VI-HEALTH HAZARD DATA	
OSHA PERMISSIBLE EXPOSURE LIMIT	533 ppm estimated
EFFECTS OF OVER EXPOSURE	
INHALATION:	Headache, signs of anesthesia, nausea, possible unconsciousness and death if vapor conc. Exceeds TLV.
SKIN CONTACT/ABSORPTION:	Mild irritation DUE TO DEFATTING OF SKIN
Ingestion: Nausea	
EYES:	Mild Irritation
EMERGENCY AND FIRST AID PROCEDURES	
EYES AND SKIN:	Flush with plenty of water for 15 minutes. If irritation develops and persists, see physician.
INHALATION:	Remove to fresh air, Resuscitate if necessary. Get medical aid.
INGESTION:	DO NOT INDUCE VOMITING, CALL A PHYSICIAN IMMEDIATELY.

VII-SPILL OR LEAK PROCEDURES
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Absorb with suitable material. Incinerate or landfill according to local, state and federal regulations.
WASTE DISPOSAL METHOD:
Aerosol cans, when vented to atmospheric pressure through normal use, pose no disposal hazard.

VIII-SPECIAL PROTECTION INFORMATION	
SPECIFIC PERSONAL PROTECTIVE EQUIPMENT	
RESPIRATORY	NONE IF VAPOR CONC. KEPT BELOW TLV.
EYE	Safety glasses recommended.
SKIN	Neoprene, if skin is easily irritated
OTHER	None
VENTILATION REQUIREMENTS	
Adequate local exhaust to keep vapor conc. below TLV.	

IX-SPECIAL PRECAUTIONS
PRECAUTION TO BE TAKEN IN HANDLING AND STORING
Do not puncture or incinerate container. Do not store at temperatures above 130^{o} F.
OTHER PRECAUTIONS
Avoid food contamination. KEEP OUT OF REACH OF CHILDREN.

APPENDIX C

SAMPLE MSDS REQUEST LETTER

This letter should be sent by the individual requesting the product or Purchasing Agent when requesting a new, revised, updated or missing MSDS for a specific product.

Each hazardous chemical must have a MSDS. You may use this form to request one from your distributor or the manufacturer; telephone them for a complete address, if necessary. When the MSDS is received, the purchasing agent should provide a copy to the regional supervisor.

IMPORTANT: Keep a copy of each letter sent for Department records until the MSDS is received and cataloged.

Date

Manufacturer/Distributor
Address
City, State, ZIP Code

RE: Material Safety Data Sheets

Gentlemen:

Request Material Safety Data Sheets (MSDS), required by the Hazard Communication Standards, for the product(s) listed below:
1.

2.

The MSDSs are necessary to our Hazard Communication Program. Each MSDS must meet the requirements of Washington Administrative Code (WAC) 296-62-054 "Hazard Communication Standard" (equivalent to 29 Code of Federal Regulations (CFR) 1910.1200 "Occupational Safety and Health Administration (OSHA) Hazard Communication Standard"). The Washington Military Department recognizes a complete and accurate OSHA Form 174 MSDS that complies with State requirements.

Thank you for your assistance. Questions regarding this request can be directed to the point of contact.

Sincerely,

Name, address, phone number and e-mail address if available.

APPENDIX D

QUESTIONS AND ANSWERS ABOUT THE STANDARDS

1. MATERIAL SAFETY DATA SHEETS (MSDS):

   a. Who is responsible for the accuracy of MSDSs?

      ANSWER: The manufacturer, importer or employer preparing the MSDS must make certain the information accurately reflects the scientific evidence used in making the hazard determination.

   b. Can computerized data sheet files be used as long as employees have proper access and knowledge of how to use them?

      ANSWER: Yes, the standard says that an MSDS may be in any form as long as it contains the required information. You must make certain the required information is provided for each hazardous chemical and is readily accessible to employees in each work area on each shift.

   c. Does the Department have to obtain MSDSs on hazardous materials we don't order or use very often?

      ANSWER: Yes, the unit/division/department **must** keep an MSDS on each hazardous chemical used in the workplace.

   d. Do contractors have to make MSDSs available to their employees when they are working at non-fixed locations, such as construction sites?

      ANSWER: Yes, MSDSs may be kept at the contractors' permanent base if employees leave and return on a daily basis. Contractors who establish a temporary base, such as a trailer at a worksite, are required to have MSDSs available at the site.

2. LABELS AND RECORD KEEPING:

   a. Must labels and MSDSs be translated into a foreign language if the majority of workers don't speak English?

      ANSWER: No, however, a reasonable effort must be made to inform all employees of the hazards in the workplace. Labor and Industries will, on request, provide translation assistance in the following languages: Cambodian, Chinese, Korean, Spanish and Vietnamese.

   b. Do all "hazardous materials" containers need to be labeled?

ANSWER: No, portable containers which meet the "immediate use" criteria of the standard do not have to be labeled.

c. Do pipes and piping systems need to be labeled?

ANSWER: No, the standard requires only containers to be labeled. Pipes and piping systems are not considered containers for the purpose of hazard communication. (Other regulations may require pipes and piping systems to be identified.)

d. Does a list of MSDSs satisfy the requirement of a hazardous chemical inventory?

ANSWER: Yes, as long as the product names or chemical names used on the inventory are the same as those used on the MSDSs and labels. A copy of the list must be made available to employees.

3. TRAINING DEPARTMENT EMPLOYEES:

a. If there is more than one employer at a single jobsite, who is responsible for employee training?

ANSWER: Each employer must train his or her own employees. However, if an employer hires employees on contract from a temporary employment service, the (hiring) employer is responsible for informing and training the worker(s) about hazardous chemicals at the worksite.

b. Does each supervisor have to train employees about handling each brand of chemical?

ANSWER: No, different brands of the same chemical have the same hazard. Information and training about one brand is considered to apply to the other brands.

c. Do workers have to be retrained whenever a new brand is introduced into the work area?

ANSWER: No, however, workers must be retrained whenever a new chemical hazard is introduced.

d. Will employees who rarely encounter hazardous chemicals need to be trained?

ANSWER: Yes, employees must be trained on any hazardous chemical to which they could be exposed. Training should address the type of exposure encountered and the degree of danger involved.

e. Is generic training acceptable if we use larger numbers of chemicals?

ANSWER: Yes, the standard does not specify how training is to be performed; it only specifies who will be trained and the minimum content of the training. Grouping chemicals with similar hazards for training purposes is acceptable.

f. Do I have to keep records about who has received training on hazardous chemicals?

ANSWER: Yes, documentation of employee training is required by the standard.

4. SOME FUNCTIONS OF LABOR AND INDUSTRIES:

a. What will Labor and Industries do about manufacturers or importers located outside of Washington who do not provide MSDSs?

ANSWER: L&I will take administrative and legal action, if necessary, to get MSDSs from uncooperative manufacturers, importers or distributors. Federal OSHA will also assist in obtaining MSDSs.

5. GENERAL PROVISIONS OF THE HAZARD COMMUNICATIONS STANDARD:

a. If a MSDS is not provided with a product, can it be assumed it's not hazardous?

ANSWER: No, the manufacturer should be contacted and asked for a MSDS if the chemical is suspected of being hazardous.

b. Some of the newer office copy machines use hazardous chemicals that are enclosed in cartridges. Are employees who occasionally change these cartridges considered to be exposed to hazardous chemicals?

ANSWER: No, employees who occasionally change "cartridge type" canisters of chemicals in office machines are not considered exposed and not covered by the Hazard Communication Standard. However, an employee who even occasionally handles office machine chemicals that are not enclosed in cartridges would be covered by the standard for these hazardous chemicals.

c. Are off-the-shelf products covered under this standard?

ANSWER: Yes, consumer products are considered to be hazardous if there are hazard warnings on the label that indicates potential for physical or

health hazards and your employees will be exposed in a manner not comparable to exposure experienced by the public.

d. How is radiation covered under this standard?

ANSWER: Since the purpose of the standard is protecting employees from hazardous chemicals, radioactive chemicals are covered. Other radioactive materials do not come under this standard but are covered under Title 402 WAC.

e. Are contractors required to notify employers about hazardous chemicals on a jobsite?

ANSWER: Yes, just as employers have the obligation to notify contractors about hazardous chemicals at the worksite, contractors are required to provide MSDSs at a central location for each hazardous chemical to which the employees may be exposed. They are also required to inform the employer of any precautionary measures necessary as a result of hazardous chemicals they use, and provide an explanation of the labeling system used for their hazardous chemicals.

f. Are wood products exempt from labeling and MSDS requirements?

ANSWER: Wood and wood products are exempt from the standard, but wood dust and chemical preservatives are covered and must be treated accordingly.

g. Are biological agents covered under this standard?

ANSWER: No, biological agents, such as micro-organisms, are not included in the definition of a chemical.

APPENDIX D

Employee Training and Information

Lesson Plan Summary: HAZCOM

COURSE TITLE: **Chemical Hazard Communication**

HRDIS CODE: **01-07-SD1A**

COURSE LENGTH: One Hour

TARGET AUDIENCE: All Department personnel, all job classifications.

DESCRIPTION/PURPOSE:

To train new employees on the elements, as identified in the learning objectives, of the WMD HAZCOM Program consistent with mandatory state and federal requirements.

This training is designed to assist the new employee to be aware and protect themselves from hazardous chemicals that they may become exposed to in the course of their assigned duties.

LEARNING OBJECTIVES:

Upon completion of this course/workshop, participants will:

- Recognize the purpose of the Department's HAZCOM Program;
- Clarify who the HAZCOM Program applies to;
- Identify employee rights under the HAZCOM standard;
- Recognize the need for using personal protective equipment (PPE);
- Apply the information contained in a material safety data sheet (MSDS);
- Recognize container labeling;
- Apply necessary precautions to take when handling dangerous substances; and,
- Recognize proper hazardous chemical disposal needs.

NOTE: *This training session requires each participant to complete a HAZCOM QUIZ (MIL FORM 910) that must be corrected to 100% before training credit is provided.*

APPENDIX E

HEALTH HAZARDS IN THE WORKPLACE

1. What to do if exposed to a hazardous substance.
    a. If it is an emergency, report it immediately to your supervisor and get medical attention.
    b. If it is not an immediate emergency, report it, review the product label and/or review the Material Safety Data Sheet (MSDS) for the substance and take the appropriate action:
        (1) Follow the appropriate first aid procedures if possible.
        (2) Determine if the substance requires emergency handling procedures (MSDS).
        (3) Review appropriate precautions for handling or disposing of the substance (found on the MSDS).
        (4) Use special protective clothing or equipment if necessary (found on the MSDS).
        (5) Clean up any spills according to the approved spill or leak procedures (found on the MSDS).
    c. Notify the immediate supervisor and determine which if any outside authorities must be informed.
2. Categories of Hazardous Substances.
    a. Toxic or Highly Toxic - are substances which are literally poisonous. Some may cause death. Examples are:
        (1) Antifreeze
        (2) Welding fumes
        (3) Carbon Monoxide
    b. Corrosives - substances which can destroy tissues on contact causing localized burns. Examples are:
        (1) Oven cleaners
        (2) Acids
    c. Irritants - cause an inflammatory response to localized tissues. Such responses will include redness or swelling of skin, tearing of eyes, pulmonary edema (liquid build up in the lungs), and cough. Examples are:
        (1) Copier toner
        (2) Some solvents
        (3) Ammonia
    d. Sensitizers - may cause little effects in the beginning. However, allergic reactions to the product may occur. Examples are:

(1) Strong detergents

(2) Some solvents

e. Combustibles - substances having flashpoints as low as 100^{o} Fahrenheit.

f. Highly Flammables - are substances having flashpoints between 100^{o} and 73^{o} Fahrenheit.

g. Extremely Flammable - this pertains to liquids or liquefied gases that have a flashpoint below 73^{o} Fahrenheit. Examples are:

(1) Propane

(2) Ether (car starting fluid)

(3) Acetone

h. Dangerously Reactive - these are materials or substances which develop a rapid chemical reaction with subsequent release of energy. The byproduct of the reaction may be fire, release of toxic gas and/or explosion. Examples are:

(1) Various explosives

(2) Sodium metals (reactive with water/moisture)

(3) Fiberglass resin when mixed with a catalyst

i. Pyrophoric - these substances cause fires or detonate. Examples include:

(1) Trinitrotoluene (TNT)

(2) Phosphorus

j. Compressed Gases - are often considered hazardous because the contents are contained under pressure. Examples include:

(1) Spray cans

(2) Propane

(3) Oxygen

k. Carcinogens - are substances which are considered to facilitate and/or cause cancer. Examples include:

(1) Benzene

(2) Asbestos

(3) Trichloroethylene (TCE)

l. Teratogens - are classified as causing malformations of the fetus during pregnancy. Examples are:

(1) Ethyl alcohol

(2) Cigarette smoke

m. Mutagens - Substances which cause abnormal changes in living cells. All carcinogens are mutagens. Examples are:

(1) Ionizing radiation

(2) Some photo developers

n. Reproductive - are materials which could lead to impotence, irregular menstrual cycles, and even sexual dysfunction. Examples are:

(1) Lead

(2) Mercury

3. Harmful Physical Agent. These are physical agents which can be considered harmful if exposure time exceeds maximum limits.

a. Heat: Prolonged exposure to or activity in extreme heat can result in heat stress, prostration, and/or heat stroke. It is essential to take precautionary measures during periods of heat exposure. Drink plenty of water, rest in cool areas, acclimate yourself to hot conditions, and maintain a stable diet.

b. Cold: Prolonged activity in cold can result in minor frostbite or hypothermia. Individuals working outside should be aware of current weather conditions, wear clothing in layers and be aware of the signs and symptoms of cold injury. Symptoms can include tingling, stinging, or dull aching sensation of the exposed part followed by numbness. The skin may appear red, and then become pale or waxy white. Special precaution should be maintained when shoveling snow or conducting other work in cold environments.

c. Noise: Noise-induced hearing loss is a phenomenon which may occur due to prolonged exposure to unwanted, loud sound. Early warnings of high noise levels are a ringing in the ears after leaving a high noise area. There is no cure for permanent hearing loss. Therefore, it is essential to wear hearing protection. Ear plugs, muffs, and engineering controls should be utilized in noise areas or around loud equipment.

4. Routes of Entry. Ways in which a hazardous substance can enter the body:

a. Ingestion: The swallowing of a hazardous substance/agent. The ingestion of a substance is usually accidental and occurs when someone eats, drinks, or smokes a product contaminated by the hazardous substance/agent.

b. Inhalation: The breathing of air contaminated by particles, vapors, liquids, and/or gases or hazardous substances.

c. Absorption: Hazardous substances may not appear to be harmful to the skin, but may be absorbed through the skin into the bloodstream or other tissues.

d. Contact: Direct contact with a substance may cause injury. This usually occurs when a hazardous substance is spilled onto the skin (acids for instance) or splashed directly in the eyes.

e. Abraded Skin: This is a break in the body's first line of defense, the skin. Some hazardous substances may enter into the body through this "open window".

5. Personal Protective Equipment. Knowledge of a hazardous substance may not be enough protection. Therefore, personal protective equipment may be necessary to ensure protection against exposure. MSDS and product labels will provide information on what type of PPE should be used.

    a. Eye Protection: Goggles, safety glasses, and face shields will protect the eyes from flying objects, splashes, and other eye damaging hazards. Specially designed glasses will protect against harmful light rays. Contact lenses should not be worn in the workplace where hazardous substances are used.

    b. Noise Protection: There are two types of protection against noise. Ear plugs and ear muffs, when properly worn and maintained, will protect against permanently damaging noise. Sized, form-fitted ear plugs must be properly fitted.

    c. Special Clothing: At times a variety of clothing may be needed for a particular operation or task. Skin can be protected by using gloves, aprons, and sleeves. Feet and toes can be protected by safety shoes. Hard hats protect the head from falling objects. Barrier creams and gloves protect hands from irritating chemicals.

    d. Breathing Protection: Disposable dust masks and chemical cartridge respirators can be utilized to keep small particles from entering the respiratory tract. Chemical gas masks can offer protection against particular gases and vapors. Supplied air respirators can be utilized when exposure to extreme toxic materials occur. In compliance with WISHA standards, no negative pressure face mask will be worn until a fit test has been successfully completed.

6. Proven Techniques to Avoid Exposure and Contamination. A few simple procedures can be followed to prevent contamination by harmful substances.

    a. Hand Washing: When utilized, this is probably THE MOST IMPORTANT and cost effective method for preventing inadvertent poisoning or preventing the spread of infection.

        (1) Use warm water and wet hands and wrists before applying soap.

        (2) Apply liquid soap. Bar soap is not recommended as it can be contaminated.

        (3) Lather well, scrub for one minute paying attention to fingernails, cracks in skin and/or openings and between fingers.

        (4) Dry thoroughly with paper towels.

    b. Protective Clothing Barriers: Personal protective equipment (PPE) should be worn whenever an agent poses a threat of contamination or when a product label or MSDS advises to do so. In addition, PPE should be kept clean, stored properly, and maintained.

GLOSSARY

This glossary lists the most important terms used in Material Safety Data Sheets. If you don't understand a word or its meaning, ask your immediate supervisor for help.

Absorption - The movement of a hazardous chemical through the skin into the bloodstream.

Boiling Point - The temperature at which a liquid becomes a gas.

Catalyst - Chemical which causes a chemical reaction to happen faster.

Combustible - A liquid that becomes flammable when it reaches a temperature over 1OO^{o}F.

Concentration - Parts Per Million (PPM) is a volume per volume relationship of concentration. There are so many parts of a material per one million parts of another substance.

Decomposition Products - Products that are released when a material is exposed to aging, heating, burning, air, or allowed to react with another material.

Evaporation Rate - The time it takes a given amount of a material to completely dry up, compared to ether which evaporates very quickly, or to butyl acetate, which evaporates very slowly.

Flammable (Explosive) Limits-LEL and UEL - A flammable material will burn in air when ignited. Materials are either flammable, combustible, or explosive. When a materials concentration is below the LEL or Lower Explosive Limit the material is too lean to burn. When the material concentration is above the UEL or Upper Explosive Limit, the material is too rich to burn. The material will burn if the concentration is between the LEL and UEL.

Flash Point - The temperature at which a flammable liquid produces enough vapor to burn.

Incompatibility - A list of materials that should not be combined in order to avoid an adverse reaction.

Ingestion - Taking a material by mouth and swallowing the material.

Inhalation - Breathing vapor of gas from a material.

Oxidizing Agent - A material that gives off oxygen in a chemical reaction.

Polymerization - A reaction with extremely high or uncontrolled release of energy.

Reactivity - The ability of a material to undergo a reaction which releases energy or heat.

Solubility - The tendency of a material to dissolve in water or other solvent.

Stability - The tendency of a material to resist undesirable chemical changes during storage or transport.

Threshold Limit Value (TLV)/Permissible Exposure Limit (PEL) - Both indicate safe

exposure levels meaning the level to which an individual can be exposed to each day with no adverse effects.

Vapor Density - The weight of a vapor compared with an equal volume of air. If less than "one," the vapor will rise in air. If greater than "one," it will tend to fall in air.

Vapor pressure - A high vapor pressure indicates a liquid will evaporate easily.

Volatile Percent - The percentage of a liquid or solid that evaporates at room temperature. The higher the percentage, the faster the material evaporates. Fast evaporation means greater danger.